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Schools, Neighborhoods and the Formation of Criminal Networks**

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Partners in Crime

Schools, Neighborhoods and the Formation of Criminal Networks

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Criminal activity is greatly influenced by peer interactions. Patterns of crime across neighborhoods and over time display strong evidence of social interactions (Glaeser, Sacerdote and Scheinkman 1996). A number of recent studies find evidence for peer effects in criminal activity across a wide variety of contexts such as neighborhoods, schools, and juvenile corrections facilities (Ludwig et al 2001, Kling et al 2005, Cook and Ludwig 2006, Bayer, Hjalmarsson and Pozen 2009, Deming 2011, Billings, Deming and Rockoff 2014).

A key unresolved question, however, is the underlying mechanism for peer effects in crime. As first noted by Manski (1993), observed peer effects can be driven directly by group behavior (an “endogenous” peer effect), or they can be driven by exogenous attributes of a group as well as by assortative matching on similar individual characteristics. While recent work has used random assignment of individuals to peer groups to account for sorting, the distinction between endogenous and exogenous peer effects has remained elusive.¹

¹ Bayer, Hjalmarsson and Pozen (2009) show that criminal peer effects are stronger when juveniles who have similar criminal expertise are grouped together. Damm and Dustmann (2014) study the impact of growing up in a high-crime neighborhood on adult crime, and find that it is the *share* of criminals (rather than the number of crimes committed) in one’s neighborhood that determines later criminal activity. While both papers show circumstantial evidence of direct social interactions, neither can distinguish direct criminal partnership from other mechanisms such as social learning or changing preferences.

In this paper we study the influence of a particularly important social environment –the school – on the formation of criminal partnerships. We match administrative data from Charlotte-Mecklenburg schools (CMS) to arrest and criminal incident and location records, which allows us to determine precisely when individuals commit crimes together.

Figure 1 displays our key result visually – individuals who live the same physical distance apart are much more likely to be “partners in crime” when they attend the same school. Two individuals living 0.5 km apart or less are 4.6 times more likely to form a criminal partnership when they attend the same school. We also find that criminal partnership is much more likely among youth of similar age and gender, and among students who shared the same grade and classroom in a school.

To ensure that this relationship is not biased by sorting across school attendance boundaries, we exploit the 2002-2003 redistricting of CMS schools, which changed neighborhood school assignment for more than half of students in the county (Billings, Deming and Rockoff 2014). By restricting our sample to individuals living on either side of a newly drawn school boundary, we ensure that our results are not biased by sorting on unobserved attributes that might affect the probability of criminal partnership. As we discuss later, our results are robust to a wide variety of alternative sample restrictions and robustness checks.

We also test for the possibility of agglomeration externalities in crime – namely, that the availability of potential partners increases the *overall incidence* of crime. We find that increases in the number of same age, race and gender peers within a 1 km radius significantly increases a student’s own probability of committing a crime, but only when those peers attend the same school.

This paper makes two main contributions. First, we provide evidence of peer effects in crime that are directly driven by changes in peer *behavior*, rather than the exogenous characteristics of the group (Manski 1993). Concretely, suppose that the only mechanism for peer effects in crime was social learning (i.e. I see a peer benefit from committing a crime, so I become more willing to commit a crime myself). In that case, while the impact of being assigned to a school with more crime-prone peers would increase one's own crime, it would *not* affect the probability of criminal partnership. Our results provide evidence of peer effects through direct interaction – committing crimes together, and thus a reduction in crime among some youth in a school *would* have clear social multiplier (Manski 2000).

Our second main contribution is to provide evidence on the importance of schools as a social setting for criminal network formation. While several other studies finds important impacts of schools on criminal behavior (e.g. Jacob and Lefgren 2003, Cullen, Jacob and Levitt 2006, Deming 2011, Billings, Deming and Rockoff 2014), this paper pushes forward on the causal mechanism by demonstrating that schools strongly affect the formation of criminal partnerships. However, our results do not rule out school effects on crime through other mechanisms such as changing criminal opportunities or the return to education.

Data

Our sample is comprised of administrative records from Charlotte-Mecklenburg Schools (CMS) for all individual students that attended public school in the county. We limit the sample to students that we observe at age 14 between the 2002-2003 and 2008-2009 school years, as well as students for which we observe a residential address during this period. The data include student gender, race, yearly end-of-grade (EOG) test scores, days absent and days suspended

from school. The EOG tests are standardized and administered across the state of North Carolina from 1993 to the present.

This sample allows us to identify the residential location of students two years prior to age 16, which is the age at which criminal offenders in North Carolina are included in the registry of all adult arrests. We link CMS data to arrest registry data for Mecklenburg County from 1998 to 2013 using first and last name as well as date of birth.² The arrest data includes individual names and identifiers,³ and information on the number and nature of charges. We define “offenders” as students who were arrested during our sample period between the ages of 16 and 21. While this data allow us to observe future criminal behavior of CMS students, regardless of whether they transfer or drop out of school, they are limited to crimes committed within Mecklenburg County.

Beginning in 2005, the registry of offenders was linked to records of all criminal incidents, so that officers could better understand crime patterns among repeat offenders. This data allows us to identify individuals that were arrested for the same crime, at the same time. Approximately, 11 % of all reported crimes from 2005-2013 that led to an arrest were committed with one or more partners. Crimes committed by partners are disproportionately burglaries, robberies, and drug offenses.

We use our linked student and arrest data to generate pairs of students who are also criminal partners. Specifically, we create an indicator variable for a criminal partnership if both individuals were arrested for the same crime. Since our data uniquely links each individual’s arrest back to the Charlotte-Mecklenburg Police Department (CMPD)’s reported crime database,

² Our match rate between student and arrest records is 94% and this same matching procedure has been incorporated and verified in Deming (2011) and Billings, Deming and Rockoff (2014) for these two datasets.

³ The Mecklenburg County Sheriff (MCS) tracks arrests across individuals using a unique identifier that is established with fingerprinting.

it allows us to determine if two individuals were arrested for the same crime even if each member of the partnership was arrested at different times.

We define residential neighborhoods within Mecklenburg County using 373 Block Groups from the 2000 Census. We identify Block Groups that were bisected by middle and high school attendance zone boundaries that were newly drawn during the summer of 2002 redistricting. Our primary analysis involves the sample of offenders who attended public school at age 14 and resided in one of these bisected block groups between the 2002-2003 and 2008-2009 school years.

Table 1 provides descriptive statistics for our sample. Panel 1 presents arrest data between ages 16 and 21, and panel 2 presents basic individual demographics, education outcomes, and school and neighborhood attributes. The first column shows means for the full sample of students, the second column presents means for all offenders, and the final column presents means for all offenders who were arrested for committing a crime with one of more partners.

The arrest rates among our sample of students are high, with 17 percent of the sample ever being arrested and 3 percent of the sample being arrested for violent crimes.⁴ Among those students ever arrested, the incidence of violent crime is 19 percent, but jumps to 31 percent for offenders who commit crimes with partners. Offenders are more likely to be male, black, have low test scores, more absences and suspensions, reside in poorer neighborhoods, and significantly have more same age and same age-same school peers.

The overall criminal partnership rate for our sample of offenders is 6 percent with partner crimes tending to be more serious in nature as most of them are categorized as violent or

⁴ Based on the FBI Uniform Crime Reporting, we classify violent crimes as assault, kidnapping, rape and robbery, while property crimes are auto theft, burglary, fraud/forgery, larceny and criminal trespassing (attempted burglary).

property crimes. Other attributes are broadly similar between all offenders and those offenders involved in criminal partnerships.

Our main dataset for examining criminal partnerships is constructed by taking our sample of offenders (which are restricted to only CBG bisected by new boundaries in 2002) and merge each individual in that sample with all offenders j from our full CMS sample who are within three years of age of individual i .⁵

Tables 2 and 3 present descriptive statistics for the sample of matched pairs who live within 1 kilometer of each other based on the school assigned and on the school attended respectively.⁶ The first three columns present the subsample of all offender pairs, all pairs who attend the same school and all offender pairs who attend different schools. The final three columns present the means for subsamples of pairs who were arrested together in the commission of a crime. The first panel presents the incidence of partnership, the number of crimes and the types of crimes, and the second panel presents the match between the two individual offenders in terms of courses taken and offender demographics. Partnerships are more common among the 16-18 year old pairs, and partnerships are more likely to arise for felony arrests. Based on the sample sizes and the number of partnerships in the last two columns, partnerships are also substantially more frequent when offenders attend the same school. The patterns are very similar for both the assigned and attended school.

To formally test if being assigned to the same school is exogenous to student attributes, we provide a balancing test in Table 4 for our sample of paired offenders given in Tables 2 and 3. Table 4 presents the results of a regression of whether offenders i and j are assigned to the

⁵ We limit analysis to individuals within 3 years of age since less than 5% of criminal partnerships involve individuals more than 3 year apart. Even with this restriction, the size of this dataset is substantial (over 65 million observations) and thus we limit our analysis to pairs of individuals within certain distance thresholds.

⁶ One kilometer is identified as the threshold for which the relationship between distance and probability of partnership approaches zero in our dataset.

same school (column 1) or assigned to the same school and grade (column 2) based on demographic attributes, test scores, suspensions and absences for individuals j controlling for block group fixed effects. Individual coefficients are insignificant and small in magnitude given the large number of pairs assigned to the same school in this sample. Our F-statistics highlights that jointly these coefficients are not statistically different from zero.

Empirical Strategy

Our strategy for examining the role of school peers in criminal activity involves taking a sample of individuals that were ever arrested for at least one crime and determining the probabilities that these individuals form criminal partnerships. Formally, our main empirical model is based on a dataset of offenders designated by i who sorted into the same neighborhood n , where redistricting caused this neighborhood to be divided by an attendance zone boundary. Each offender in this neighborhood is then matched to all offenders k (drawn from all offenders in our data) who attend school t , which may or may not equal s . A dummy variable P is set to one if the two individuals i and k have ever been arrested together for committing a crime and zero otherwise.

We then ask the following question: Is an individual more likely to commit a crime with an individual in the same neighborhood if they are also assigned to the same school? Concretely, suppose that the probability of criminal partnership depends upon both spatial proximity and school attended:

$$P_{isnkt} = f(d_{ik}) + g(d_{ik})D(s = t) + \varepsilon_{isnkt} \quad (1)$$

where f and g are functions that describe the relationship between the probability of partnership and distance (d_{ik}) between the two individuals, D is an indicator for whether the two individuals

are assigned to the same school or the same school and grade, and ε_{isnkt} is an idiosyncratic error. The function f captures the reduced form relationship over distance for pairs of offenders who are assigned to different schools, and our function of interest g captures the effect of school assignment on this relationship.

In order to generate exogenous variation in school assignment, we focus our analysis on neighborhoods that were bisected by a new school attendance boundary in the summer of 2002 due to court-ordered resegregation.⁷ To further address the sorting of individuals to neighborhoods, we restrict our analysis to pairs of individuals that resided small distances apart as rising 9th graders, and those who were arrested for at least one crime by age 21.

Intuitively, our identification strategy asks whether the probability of criminal partnership between any two offenders who live the same distance apart is greater when they also attend the same school. Moreover, our restriction to *newly formed* school boundaries ensures that the impact of attending the same school on criminal partnership is not biased by sorting across historically stable school assignment zones.⁸

We extend the model by adding a neighborhood fixed effect δ_n based on i 's neighborhood and controls X_{kt} for the individual k who is being paired with each individual i in neighborhood n , where X_{kt} might include attributes of k 's assigned school. Specifically,

$$P_{isnkt} = f(d_{ik}) + g(d_{ik})D(s = t) + \delta_n + \beta X_{kt} + \varepsilon_{isnkt} \quad (2)$$

The neighborhood fixed effect implies that g is identified by differences in the frequency of criminal partnership between offenders i and j who reside in the same neighborhood, but are on

⁷ See Billings, Deming, Rockoff (2014) for a discussion of school reassignment under the end of court-ordered busing in Charlotte-Mecklenburg Schools. The authors show that new school boundaries are not related to observable student attributes.

⁸ As robustness tests, we estimate models that include distance bin fixed effects, individual fixed effects for each individual k who is paired with all individuals in the same neighborhood as well as models that control for individual k by neighborhood n fixed effects.

opposite sides of the recently defined attendance zone. Both offenders are paired with some additional offenders k who are assigned to the two schools represented in i and j 's neighborhood, and by construction the same school variable takes different values for i and j for all of those pairs. Note that if the inclusion of δ_n yields a sample that is conditionally balanced over the elements of X_{kt} then the inclusion of X_{kt} as a control should have no impact on the estimates of f and g .

Our initial analyses estimates f and $f+g$ by creating a histogram of the distribution of criminal partnership frequency over distance separately for pairs of offenders in the same school and pairs of offenders in different schools. In our follow-up analyses, we restrict the sample to k 's who reside within a specified distance threshold \bar{d} of an individual i . If both f and g are step functions at \bar{d} , equation (2) can be rewritten as

$$P_{isnkt} = \gamma_0 + \gamma_1 D(s = t) + \delta_n + \beta X_{kt} + \varepsilon_{isnkt} \text{ if } d_{ik} < \bar{d} \quad (3)$$

where γ_0 is the height of the step function of f , γ_1 is the height of the step function of g , and \bar{d} is the location of the step for both functions. We specify \bar{d} based on the distribution of criminal partnership over pairwise distances d_{ik} . Standard errors for this model and for generalizations of this model are clustered at the neighborhood n level of individual i in each pair.

In addition to studying the impact of attending the same school, we also explore whether the probability of criminal partnership is greater when partners are in the same grade in school, as well as whether they shared a classroom together. However, unlike our results for school assignment (which is arguably exogenous), assignment to grades and classrooms is potentially biased by sorting and so we treat these results as suggestive. We also examine whether criminal partnership is greater when students share similar characteristics such as race, gender, age and test scores.

Finally, since higher likelihood of criminal partnership may partially reflect agglomeration of potential criminals, we test whether increased opportunities for criminal partnership affect the likelihood of committing a crime. Specifically, the likelihood of committing a crime is allowed to depend upon the number of students N who share attributes with potential partners and reside within a specified distance; the number of students S who share these same key attributes with this student including residential proximity and are assigned to the same school; neighborhood fixed effects δ_n and individual controls X_{isn} .

$$C_{isn} = \alpha_1 N(X_{kt,v-w} = X_{is,v-w} | d_{ik} < \bar{d}) + \alpha_2 S(X_{kt,v-w} = X_{is,v-w} | d_{ik} < \bar{d}, s = t) + \delta_n + \beta X_{isn} + \mu_{isn} \quad (8)$$

where N and S are constructed so that they contain the number of students k who match student i on attributes v through w in the vector X_{kt} and satisfy the conditioning criteria, distance threshold for N and both distance threshold and same school for S .

Results

Graphical Analysis

We begin with graphical results that display the relationship between distance and the probability of criminal partnerships.⁹ Figure 1 plots the probability of a pair of offenders committing a crime together as a function of the distance between the offenders separately for the same and different school subsamples.

For the same school sample, the figure shows that the probability of partnership is high when the offenders are within a few hundred feet of each other, and declines quickly towards

⁹ The distribution of offenders and partners (all as well as subsamples for same/different school) is presented in Appendix Figures A.1, A.2 and A.3.

zero and is very near to zero once the offenders are 2000 feet away or more. The probability of partnership for offenders who attend different schools is small and does not demonstrate any significant relationship with distance. This constitutes strong *prima facie* evidence that attending the same school increases the likelihood of criminal partnership, even for students who live in the same neighborhoods.

Figure 2 replicates Figure 1 controlling for block groups fixed effects associated with the residence of offender i and the observed attributes of offender j . Figure 3 repeats Figure 2 except that the restriction is for pairs that are assigned to the same school and grade, and the results are similar to Figure 2, but do show larger differences between same school/grade probabilities and different school probabilities of partnerships up to about 1km.

Figure 4 presents the difference between the relationship for pairs who are assigned to the same school/grade and the relationship for pairs that do not attend the same school, shown in Figure 3. The 95% confidence intervals are represented by the shaded area. The differences for both figures are statistically significant for pairs who are located within about 1000 feet of each other and differences are almost significant again at distances closer to 1 km.¹⁰ Overall, these results highlight a strong positive relationship between shared school assignment and criminal partnerships for individuals that live very close together.

In order to verify that these results are due to school assignment boundaries and not the spatial distribution of offenders, we conduct a falsification test in Figure 5. To implement this test, we randomly shifted all boundaries by between 1 and 2 kms and constructed a new version of Figure 4. We repeated this exercise 500 times in order to create a distribution of false boundary discontinuities and present the average results as a solid line and a 95% confidence

¹⁰ The standard errors are bootstrapped based on resampling from the data 500 times.

interval as the shaded area in Figure 5. Figure 5 does not demonstrate any relationship between same school and partnership based on spatially relevant, artificial attendance zone boundaries.

Regression Results

Table 5 presents results based on pairs who are within either $\frac{1}{2}$, 1 or 2 kilometers of each other, with the same dependent variable as the figures above: being arrested together for at least one crime. The right hand side variables in the model are assigned to same school and assigned to same school and same grade based on birth date.¹¹ All models include block group fixed effects for offenders i in the bisected block groups and controls for the observable attributes of the paired offenders j . Column 1 presents estimates of the partnership model for these subsamples. The coefficients on offenders being assigned to the same school and assigned to the same school and grade are both positive and highly statistically significant for all distance thresholds.

Consistent with our figures, the strongest effects occur for individuals residing within $\frac{1}{2}$ km and effects weaken as we extend distance thresholds out to 2 km. Given the limited number of observations in different schools within $\frac{1}{2}$ km, we focus our analysis on results for 1km. Results at 1 km are more precise than the $\frac{1}{2}$ km results and quantitatively similar magnitudes relative to mean partnership rates. For column 1, being in the same school increases the probability of being criminal partners by 0.25 percentage points and being in the same grade increase this probability by an additional 0.38 percentage points. Overall, being assigned to the same school and grade will almost triple the probability of criminal partnerships for two individuals living in the same neighborhood (1km) from a mean probability of 0.0036 to 0.0099.

¹¹ Same grade in the school attended models is based on starting kindergarten when an individual is age 5 by September 1st and normal grade progression.

The rest of the columns in Table 5 present the model using the number of crimes committed together, if individuals were partners at age 16-18, partners at age 19-21, and finally partnerships for specific crime classifications.¹² Column 2 examines if schools have an effect on the number of partnerships between two offenders. Results for both same school and same school/grade are positive and the magnitudes are larger than other estimates relative to the mean number of partnerships.

Being in the same school and grade increases the number of partnerships by 0.0134, which is a 335% increase over the mean number of partners. Partnership effects for both same school and same grade persist except for the 19-21 age sample where effects are primarily at the same school level. The fact that age 16-18 and age 19-21 results differ for same school and grade coefficients is consistent with partnerships being more likely during years that individuals are still in school or recently dropped out of school. Results for crime categories show a consistent role of school in increasing criminal partnerships for a variety of criminal activities.

Table 6 replicates Table 5 for the 1 kilometer sample using whether partners actually attended the same school, the same school and same grade, and attended at least one class together. These models all include fixed effects for individual k since individuals likely attended schools and specific courses based on a number of unobserved attributes. Most of the effects are concentrated among pairs who attended at least one class together, but partnership effects also arise at both the grade and school level.

The magnitudes of our effects are larger in these models even though in some cases we lose statistical significance. For column 1, being in the same course, grade and school increase the probability of partnership by 0.0142 percentage points with is 394% increase over the mean

¹² Appendix Table 1 shows school assigned results by further disaggregated types of crime.

partnership probability. Again, we find that the effects on 19-21 year old partners are substantially smaller than for 16-18 year old partners.¹³

Table 7 presents a series of robustness tests for the school assignment model shown in panel 1 and the school attended model in panel 2. The first column presents the main results for the within 1 kilometer sample. The second column presents the model for the same sample, but including fixed effects based on bins for different distances between the individuals in the pair. The third and fourth columns present the model for the ½ kilometer sample, without and with the distance bin fixed effects, respectively. Column 5 presents results for the 1 kilometer sample replacing offender j 's observable attributes with an individual offender fixed effect. Columns 6 and 7 presents the results for the 1 kilometer sample without and with individual fixed effects where same school assignment is based only on attending the same high school. The final column presents estimates controlling for residential block group of offender i by individual offender j fixed effects. Results are largely consistent across these models with the only noticeable difference of smaller coefficients on same school and grade when implementing individual offender fixed effects.

Assortative Matching

Since offenders may form partnerships based on students attributes, Table 8 and 9 present results from models where we examine heterogeneity in the likelihood of two offenders partnering together based on same assigned or attended school. We re-estimate our main model from Table 5 including additional controls for the socio-economic/demographic match between the two offenders in any pair, and interact these controls with the assigned to the same school dummy variable. These variables include whether the offenders are assigned to the same grade,

¹³ Appendix Table 2 shows school attended results by further disaggregated types of crime. .

have the same gender, same race, whether one or both were suspended and whether one or both reside in single family housing. The effects of same gender are allowed to vary by gender, and the effects of same race are allowed to vary between white, black and Hispanic offenders.

We find strong effects of increased partnership when the offenders in the pair are in the same grade, are both male and are either both white or both Hispanic. The same race effect does not persist for black offenders. We also do not observe any effects associated with suspension or attendance. These results are robust to using number of crimes committed together and for both the 16-18 and the 19-21 age group subsamples. Table 9 repeats this analysis for the attending the same school and being in a class together models. While less strong in some cases, effects continue to be concentrated among partnerships between offenders who are the same age, are both male and are both white or both Hispanic.

Crime Agglomeration

Since higher probabilities of criminal partnerships may just be a function of more crime, we examine how much the concentration of peers influences the probability of becoming an offender. Tables 10 and 11 present models that build on our analysis by estimating models for the likelihood of individual youths to commit a crime. Specifically, we draw a sample of students from bisected blocks and calculate both the number of potential partners overall and the number of potential partners in the same school. We define a student's potential partners in two ways: 1. nearby (within 1 kilometer), similar age/assigned grade students, and 2. nearby, similar age/assigned grade students, same race and same gender students.

As a balancing test, we regress the number of same school potential partners on the number of potential partners, student observable attributes and block group fixed effects. As

shown in Table 10, student observables are not able to predict the number of same school potential partners for either definition. Then, we regress ever committed a crime on the number of potential partners, the number of same school potential partners, student observable attributes and block group fixed effects.

Table 11 provides two sets of results for these peer size models and reports two coefficients for each model. The first coefficient in each model indicates the effect of an additional 10 same school and neighborhood peers while the second coefficient indicates the effect of an additional 10 same neighborhood peers. Since we want to control for the overall number of peers in the neighborhood and simply vary the number of same school peers, we focus on the first coefficient for each model. When potential partners are defined based on same age/grade, race and gender, we find large positive effects of same school potential partners on the likelihood of any student committing a crime, but effects on crime are only present when we exploit the pattern of higher partnership rates among same gender and same race students.

The coefficients on same school, age, race and male peers indicate that 10 additional peers increases the probability of ever being arrested by 2.0 percentage points. If we were to increase the number of peers by 20 (one standard deviation), we estimate an increase in the probability of ever being arrested of 4.0 percentage points or about a 25% increase in the probability of arrest relative to the average student.

This is a nontrivial increase in arrest probability, but substantially smaller in relative terms to the 300% or more increase in partnership probabilities from same school and grade assignment. Notably, our measure of peers also explains ever having a crime partner although estimates are not precise. The magnitude of the coefficient for the number of same school, age, race and male peers indicates that a standard deviation increase in peers generates a 1.28

percentage point increase in partnership crimes, which represents an increase of over 100% from the mean probability of a partnership crime.¹⁴ It does appear that crime agglomeration explains some of the higher partnership rates for individuals with similar attributes in the same school and grade.

Robustness Tests based on 2001 Address

To test the sensitivity of our main results that incorporate age 14 residential location, we repeat our core analysis of the relationship between schools and criminal partnership rates using an offender's 2001 school residential address.¹⁵ This restriction uses residential location that could not have been affected by the 2002-03 redistricting, but adds considerable noise because the population of future offenders is very mobile between 2001 and our sample period. Table 12 presents the same school balancing tests for this sample, and again student demographics cannot explain the within block group variation in a pair of offenders being assigned to the same school. Figure 6 presents the conditional probability of partnership separately for our same school and grade and different school subsamples, and Figure 7 presents the difference between these probabilities.

We observe a pattern that is similar to earlier results in Figures 4 and 5 with less precise estimates. One can see smaller probabilities of partnerships for individuals in different schools, large probabilities that decline with distance for individuals in the same school, and differences that are statistically significant for partners that are very close to each other. While attenuated by measurement error, we continue to find statistically significant effects of being assigned to the

¹⁴ We re-estimate models identifying potential partners only based on the block group of residence, as potentially noisier measure of potential partners. The results are qualitatively similar, but the magnitude of the estimates while large are attenuated and not statistically significant. Those estimates are shown in appendix tables 3 and 4.

¹⁵ We lose about 25% of our observations due to individuals not attending public school in CMS in 2001.

same school and grade on partnership for our 1 and 2 kilometer samples, and estimates are robust to a number of different models show in Table 13. In fact, once we account for the lower partnership rates in our dataset using 2001 addresses, we find being in the same school and grade generates about a 100% increase in the probability of partnership relative to our mean partnership rates. The attenuation in our results using older addresses for our sample does decrease the magnitude of our estimates, but even with this more conservative model, we find substantial effects from same school assignment and attendance on partnership probabilities.¹⁶

Conclusion

In this paper we study the influence of schools and neighborhoods on criminal partnership. We find that two youth who live an equal distance apart are far more likely to be “partners in crime” when they also attend the same school. This result holds especially strongly for youth of the same age and gender, and for those who also share the same grade and classroom within a school. We also find evidence for agglomeration externalities in crime, which suggests that social interactions affect the probability of committing a crime as well as the probability of criminal partnership conditional on crime.

Our results have important implications for models of endogenous social interactions. We demonstrate that the social context of the school affects crime through a direct effect on peer behavior, not simply changes in exogenous characteristics or sorting on similar characteristics. This suggests that interventions which reduce crime among a subset of youth within a school will have a spillover effect on other potential criminals, leading to a social multiplier that would not exist if the mechanism were purely social learning or school context.

¹⁶ The results for models that allow for heterogeneous effects of same school on the likelihood of partnership and that exploit this relationship to examine the effect of potential partners on criminal activity provide qualitatively similar estimates, but the attenuated estimates are statistically insignificant.

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Table 1: Summary Statistics - Individuals

	All Students	Ever Arrested (16-21)	Criminal Partners
<i>Crime Outcomes</i>			
Ever Arrested (16-21)	0.17 (0.37)	1.00 (0.00)	1.00 (0.00)
Ever Arrested Violent (16-21)	0.03 (0.18)	0.19 (0.40)	0.31 (0.47)
Ever Arrested Property (16-21)	0.07 (0.26)	0.43 (0.49)	0.66 (0.48)
Crime Partnership	0.01 (0.10)	0.06 (0.24)	1.00 (0.00)
Number of Partners	0.01 (0.14)	0.07 (0.34)	1.22 (0.68)
<i>Background Characteristics</i>			
Male	0.50 (0.50)	0.69 (0.46)	0.86 (0.35)
Black	0.48 (0.50)	0.70 (0.46)	0.78 (0.41)
Hispanic	0.11 (0.31)	0.08 (0.27)	0.08 (0.28)
Single Family Home	0.79 (0.41)	0.75 (0.44)	0.84 (0.37)
Math Test Score (8th grade)	-0.06 (0.98)	-0.60 (0.84)	-0.73 (0.78)
Read Test Score (8th grade)	-0.04 (0.97)	-0.57 (0.91)	-0.78 (0.87)
Missing Test Score (8th grade)	0.23 (0.42)	0.22 (0.42)	0.18 (0.39)
Total Days Absent (8th grade)	9.15 (11.64)	16.57 (17.03)	19.44 (17.89)
Total Days Suspended from School (8th grade)	2.21 (6.10)	6.89 (10.51)	9.23 (11.78)
Same Age Peers within 1 km (0s)	6.64 (4.35)	5.92 (4.07)	6.23 (4.10)
Same Age & School Peers within 1 km (0s)	5.81 (4.15)	5.11 (3.80)	5.58 (3.96)
CBG Median HH Income (000s)	56.90 (20.79)	48.73 (18.22)	46.52 (16.73)
People per sq mile (000s)	2.11 (1.82)	2.39 (1.94)	2.81 (2.01)
Observations	34,961	5,865	359

Means and standard deviations are reported above. All information regarding housing or Census Block Group (CBG) 2000 neighborhood is based on address at school age 14. The sample of all students is based on students attending CMS at school age 14 at any time from 2003-2009. The column for Ever Arrested is based on a CMS student ever being arrested in Mecklenburg County from age 16 to 21. The column for Criminal Partners is based on those students that were Ever Arrested for a crime for which another student was also arrested for that crime.

Table 2: Pairs by School Assigned

	Non-Partners			Partners		
	All	Assigned Same School	Assigned Different School	All	Assigned Same School	Assigned Different School
<i>Partner Outcomes</i>						
Any Crime Partner	0.004 (0.06)	0.004 (0.06)	0.001 (0.04)	1.000 (0.00)	1.000 (0.00)	1.000 (0.00)
Number of Partner Crimes	0.006 (0.12)	0.006 (0.12)	0.002 (0.05)	1.586 (1.13)	1.598 (1.16)	1.385 (0.50)
16-18 yr old Partnership	0.003 (0.05)	0.003 (0.05)	0.001 (0.04)	0.743 (0.44)	0.732 (0.44)	0.923 (0.27)
19-21 yr old Partnership	0.002 (0.04)	0.002 (0.04)	0.000 (0.02)	0.439 (0.50)	0.447 (0.50)	0.308 (0.47)
Violent Crime Partners	0.001 (0.03)	0.001 (0.03)	0.001 (0.02)	0.275 (0.45)	0.268 (0.44)	0.385 (0.50)
Property Crime Partners	0.002 (0.05)	0.002 (0.05)	0.001 (0.03)	0.590 (0.49)	0.596 (0.49)	0.500 (0.51)
Felony Partners	0.003 (0.05)	0.003 (0.05)	0.001 (0.03)	0.723 (0.45)	0.720 (0.45)	0.769 (0.43)
Misdemeanor Partners	0.001 (0.04)	0.001 (0.04)	0.001 (0.02)	0.365 (0.48)	0.361 (0.48)	0.423 (0.50)
<i>Background Characteristics</i>						
In Same Course	0.031 (0.17)	0.033 (0.18)	0.015 (0.12)	0.198 (0.40)	0.199 (0.40)	0.192 (0.40)
Same Age	0.187 (0.39)	0.188 (0.39)	0.180 (0.38)	0.324 (0.47)	0.342 (0.47)	0.038 (0.20)
One Year Apart in Age	0.329 (0.47)	0.330 (0.47)	0.327 (0.47)	0.414 (0.49)	0.400 (0.49)	0.654 (0.49)
Two or Three Years Apart in Age	0.484 (0.50)	0.482 (0.50)	0.494 (0.50)	0.261 (0.44)	0.258 (0.44)	0.308 (0.47)
Both Male	0.495 (0.50)	0.501 (0.50)	0.459 (0.50)	0.869 (0.34)	0.878 (0.33)	0.731 (0.45)
Both Female	0.092 (0.29)	0.090 (0.29)	0.106 (0.31)	0.050 (0.22)	0.043 (0.20)	0.154 (0.37)
One Male, One Female	0.413 (0.49)	0.409 (0.49)	0.436 (0.50)	0.081 (0.27)	0.079 (0.27)	0.115 (0.33)
Same Race	0.705 (0.46)	0.699 (0.46)	0.743 (0.44)	0.829 (0.38)	0.823 (0.38)	0.923 (0.27)
Different Race	0.295 (0.46)	0.301 (0.46)	0.257 (0.44)	0.171 (0.38)	0.177 (0.38)	0.077 (0.27)
Both Suspended (8th Grade)	0.464 (0.50)	0.462 (0.50)	0.474 (0.50)	0.529 (0.50)	0.517 (0.50)	0.731 (0.45)
One Suspended, One Not Suspended	0.428 (0.49)	0.429 (0.49)	0.424 (0.49)	0.360 (0.48)	0.366 (0.48)	0.269 (0.45)
Neither Suspended (8th Grade)	0.108 (0.31)	0.109 (0.31)	0.102 (0.30)	0.110 (0.31)	0.117 (0.32)	0.000 (0.00)
Both in SF Homes	0.551 (0.50)	0.555 (0.50)	0.525 (0.50)	0.732 (0.44)	0.730 (0.44)	0.769 (0.43)
One SF, One Not in SF	0.289 (0.45)	0.276 (0.45)	0.362 (0.48)	0.164 (0.37)	0.163 (0.37)	0.192 (0.40)
Neither in SF Homes	0.160 (0.37)	0.169 (0.37)	0.113 (0.32)	0.104 (0.31)	0.108 (0.31)	0.038 (0.20)
Observations	124,060	105,243	18,817	444	418	26

Means and standard deviations are reported above. We define assigned to the same school as two individuals being assigned to the same middle or high school based on 2003 school attendance boundaries. Same grade is based on starting kindergarten at age 5 and normal grade progression.

The sample included in this table represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 1 km of each other based on school age 14 address and live at least 130 feet apart (minimum distance between two students assigned to different schools) and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

Table 3: Pairs by School Attended

	Non-Partners			Partners		
	All	Attended Same School	Attended Different School	All	Attended Same School	Attended Different School
<i>Partner Outcomes</i>						
Any Crime Partner	0.004 (0.06)	0.004 (0.06)	0.001 (0.04)	1.000 (0.00)	1.000 (0.00)	1.000 (0.00)
Number of Partner Crimes	0.006 (0.12)	0.006 (0.12)	0.002 (0.05)	1.586 (1.13)	1.598 (1.16)	1.385 (0.50)
16-18 yr old Partnership	0.003 (0.05)	0.003 (0.05)	0.001 (0.04)	0.743 (0.44)	0.732 (0.44)	0.923 (0.27)
19-21 yr old Partnership	0.002 (0.04)	0.002 (0.04)	0.000 (0.02)	0.439 (0.50)	0.447 (0.50)	0.308 (0.47)
Violent Crime Partners	0.001 (0.03)	0.001 (0.03)	0.001 (0.02)	0.275 (0.45)	0.268 (0.44)	0.385 (0.50)
Property Crime Partners	0.002 (0.05)	0.002 (0.05)	0.001 (0.03)	0.590 (0.49)	0.596 (0.49)	0.500 (0.51)
Felony Partners	0.003 (0.05)	0.003 (0.05)	0.001 (0.03)	0.723 (0.45)	0.720 (0.45)	0.769 (0.43)
Misdemeanor Partners	0.001 (0.04)	0.001 (0.04)	0.001 (0.02)	0.365 (0.48)	0.361 (0.48)	0.423 (0.50)
<i>Background Characteristics</i>						
In Same Course	0.031 (0.17)	0.086 (0.28)	0.000 (0.00)	0.198 (0.40)	0.299 (0.46)	0.000 (0.00)
Same Age	0.187 (0.39)	0.257 (0.44)	0.148 (0.35)	0.324 (0.47)	0.357 (0.48)	0.260 (0.44)
One Year Apart in Age	0.329 (0.47)	0.409 (0.49)	0.285 (0.45)	0.414 (0.49)	0.469 (0.50)	0.307 (0.46)
Two or Three Years Apart in Age	0.484 (0.50)	0.334 (0.47)	0.567 (0.50)	0.261 (0.44)	0.173 (0.38)	0.433 (0.50)
Both Male	0.495 (0.50)	0.514 (0.50)	0.484 (0.50)	0.869 (0.34)	0.884 (0.32)	0.840 (0.37)
Both Female	0.092 (0.29)	0.083 (0.28)	0.097 (0.30)	0.050 (0.22)	0.048 (0.21)	0.053 (0.23)
One Male, One Female	0.413 (0.49)	0.402 (0.49)	0.419 (0.49)	0.081 (0.27)	0.068 (0.25)	0.107 (0.31)
Same Race	0.705 (0.46)	0.689 (0.46)	0.714 (0.45)	0.829 (0.38)	0.830 (0.38)	0.827 (0.38)
Different Race	0.295 (0.46)	0.311 (0.46)	0.286 (0.45)	0.171 (0.38)	0.170 (0.38)	0.173 (0.38)
Both Suspended (8th Grade)	0.464 (0.50)	0.456 (0.50)	0.469 (0.50)	0.529 (0.50)	0.520 (0.50)	0.547 (0.50)
One Suspended, One Not Suspended	0.428 (0.49)	0.426 (0.49)	0.429 (0.49)	0.360 (0.48)	0.347 (0.48)	0.387 (0.49)
Neither Suspended (8th Grade)	0.108 (0.31)	0.118 (0.32)	0.102 (0.30)	0.110 (0.31)	0.133 (0.34)	0.067 (0.25)
Both in SF Homes	0.551 (0.50)	0.568 (0.50)	0.541 (0.50)	0.732 (0.44)	0.721 (0.45)	0.753 (0.43)
One SF, One Not in SF	0.289 (0.45)	0.280 (0.45)	0.294 (0.46)	0.164 (0.37)	0.143 (0.35)	0.207 (0.41)
Neither in SF Homes	0.160 (0.37)	0.152 (0.36)	0.165 (0.37)	0.104 (0.31)	0.136 (0.34)	0.040 (0.20)
Observations	124,060	44,350	79,710	444	294	150

Means and standard deviations are reported above. We define attended the same school as two individuals matriculating for at least one year at the same middle or high school. Same grade is based on a pair of students being assigned to the same grade. Same course indicates if two individuals took at least two courses together in grades 6-10.

The sample included in this table represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 1 km of each other based on school age 14 address and live at least 130 feet apart (minimum distance between two students assigned to different schools) and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

Table 4: Balancing Test - Do Observables Explain Assignment to Same School?

	(1) Assigned Same School	(2) Assigned Same School & Grade
Male	-0.003 (0.007)	-0.006 (0.012)
Hispanic	-0.003 (0.021)	-0.016 (0.039)
Black	-0.015 (0.012)	-0.022 (0.024)
Single Family Home	-0.003 (0.020)	0.001 (0.036)
Math Test Score (8th grade)	-0.002 (0.006)	-0.001 (0.009)
Read Test Score (8th grade)	0.004 (0.004)	0.009 (0.007)
Total Days Suspended from School (8th grade)	0.000 (0.000)	0.000 (0.001)
Total Days Absent (8th grade)	-0.000 (0.000)	-0.000 (0.000)
Observations	124,060	38,604
F-Stat (p-value)	0.83	0.88

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors robust to arbitrary within-CBG correlation in parentheses.

All regressions include an indicator for missing a test score, dummies for year individual k turned age 5 as of 9/1, and CBG fixed effects for person j .

We define assigned to the same school as two individuals being assigned to the same middle or high school based on 2003 school attendance boundaries. Same grade is based on starting kindergarten at age 5 and normal grade progression. Column 2 excludes same school, different grade pairs. F-statistics reports p-value that all reported covariates are jointly equal to zero.

Table 5: Impact of School Assignment on Criminal Partnerships

	(1) Any Crime Partner	(2) Number of Partner Crimes	(3) 16-18 yr old Partnership	(4) 19-21 yr old Partnership	(5) Violent Crime Partners	(6) Property Crime Partners	(7) Felony Partners	(8) Misdemeanor Partners
<u>Pairs \leq 1 km</u>								
Assigned Same School & Grade	0.0038*** (0.0011)	0.0093** (0.0040)	0.0025*** (0.0008)	0.0009 (0.0008)	0.0015** (0.0006)	0.0028*** (0.0010)	0.0029*** (0.0010)	0.0013* (0.0007)
Assigned Same School	0.0025*** (0.0008)	0.0041* (0.0021)	0.0015** (0.0006)	0.0015*** (0.0005)	0.0006 (0.0004)	0.0017** (0.0006)	0.0017*** (0.0006)	0.0007* (0.0004)
Dep. Var (mean)	0.0036	0.0057	0.0027	0.0016	0.0010	0.0021	0.0026	0.0013
Observations	124,060	124,060	124,060	124,060	124,060	124,060	124,060	124,060
<u>Pairs \leq 1 / 2 km</u>								
Assigned Same School & Grade	0.0053** (0.0024)	0.0148* (0.0087)	0.0030* (0.0016)	0.0018 (0.0017)	0.0024* (0.0013)	0.0043** (0.0020)	0.0040** (0.0020)	0.0022 (0.0013)
Assigned Same School	0.0050** (0.0021)	0.0088 (0.0064)	0.0025* (0.0014)	0.0033*** (0.0012)	0.0009 (0.0009)	0.0039** (0.0016)	0.0035* (0.0018)	0.0017*** (0.0006)
Dep. Var (mean)	0.0061	0.0096	0.0041	0.0028	0.0016	0.0042	0.0048	0.0018
Observations	42,648	42,648	42,648	42,648	42,648	42,648	42,648	42,648
<u>Pairs \leq 2 km</u>								
Assigned Same School & Grade	0.0019*** (0.0005)	0.0038** (0.0015)	0.0012*** (0.0004)	0.0004 (0.0003)	0.0005** (0.0002)	0.0013*** (0.0004)	0.0014*** (0.0004)	0.0007** (0.0003)
Assigned Same School	0.0009*** (0.0002)	0.0014*** (0.0004)	0.0007*** (0.0002)	0.0005*** (0.0001)	0.0003*** (0.0001)	0.0005*** (0.0002)	0.0007*** (0.0001)	0.0002** (0.0001)
Dep. Var (mean)	0.0017	0.0025	0.0012	0.0007	0.0005	0.0009	0.0011	0.0007
Observations	397,792	397,792	397,792	397,792	397,792	397,792	397,792	397,792

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors robust to arbitrary within-CBG correlation in parentheses.

All regressions include controls for gender, race, 8th grade reading and math test scores, indicator if missing a test score, days suspended (8th grade), total days absent (8th grade), single family home indicator, indicator for year individual k turned age 5 as of 9/1, and CBG fixed effects for person j.

The sample included in this table represents all unique pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within a given distance (given by table subheadings) of each other based on school age 14 address and live at least 130 feet apart (minimum distance between two students assigned to different schools) and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

Dependent Variable is an indicator based on column heading. Number of partner crimes indicates the number of times a pair of individuals were arrested for the same crime. 16-18 and 19-21 yr old indicates the age group for which one of the partners belonged at the time of arrest. Property Crime Partnerships include partnerships where at least one individual was arrested for auto theft, burglary, fraud/forgery or larceny. Violent Crime Partnerships include partnerships where at least one individual was arrested for aggravated/sexual/simple assault, rape or robbery. Felony and Misdemeanor based on the severity of the charge at arrest and coded accordingly by the Mecklenburg County Sheriff's Department.

Table 6: Impact of School Attended on Criminal Partnerships

	(1) Any Crime Partner	(2) Number of Partner Crimes	(3) 16-18 yr old Partnership	(4) 19-21 yr old Partnership	(5) Violent Crime Partners	(6) Property Crime Partners	(7) Felony Partners	(8) Misdemeanor Partners
<u>Pairs \leq 1 km</u>								
In Same Course	0.0116* (0.0060)	0.0300 (0.0236)	0.0102* (0.0056)	0.0014 (0.0009)	-0.0002 (0.0008)	0.0085 (0.0056)	0.0082 (0.0059)	0.0035** (0.0015)
In Same School & Same Grade	0.0019** (0.0009)	0.0027* (0.0016)	0.0022*** (0.0008)	-0.0002 (0.0005)	0.0014*** (0.0005)	0.0006 (0.0007)	0.0010 (0.0007)	0.0011** (0.0005)
In Same School	0.0007 (0.0006)	0.0000 (0.0016)	0.0001 (0.0005)	0.0009** (0.0004)	0.0003 (0.0002)	0.0005 (0.0006)	0.0006 (0.0006)	0.0002 (0.0003)
Dep. Var (mean)	0.0036	0.0057	0.0027	0.0016	0.0009	0.0022	0.0026	0.0013
Observations	124,060	124,060	124,060	124,060	124,060	124,060	124,060	124,060

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors robust to arbitrary within-CBG correlation in parentheses.

The sample included in this table represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 1 km of each other based on school age 14 address and live at least 130 feet apart (minimum distance between two students assigned to different schools) and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

All regressions include fixed effects for individual k, CBG fixed effects for individual j. We define attended the same school as two individuals matriculating for at least one year at the same middle or high school. Same grade is based on a pair of students attending the same grade. Same course indicates if two individuals took at least two courses together in grades 6-10.

Dependent Variable is an indicator based on column heading. Number of partner crimes indicates the number of times a pair of individuals were arrested for the same crime. 16-18 and 19-21 yr old indicates the age group for which one of the partners belonged at the time of arrest. Property Crime Partnerships include partnerships where at least one individual was arrested for auto theft, burglary, fraud/forgery or larceny. Violent Crime Partnerships include partnerships where at least one individual was arrested for aggravated/sexual/simple assault, rape or robbery. Felony and Misdemeanor based on the severity of the charge at arrest and coded accordingly by the Mecklenburg County Sheriff's Department.

Table 7: Other Models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Dist. FE	1/2 km	Dist. FE 1/2 km	Student FE	Same HS only	Student FE Same HS only	Student by CBG FE
Assigned Same School & Grade	0.0038***	0.0038***	0.0052**	0.0051**	0.0028***	0.0038***	0.0027***	0.0028***
	(0.0011)	(0.0011)	(0.0024)	(0.0023)	(0.0008)	(0.0012)	(0.0008)	(0.0008)
Assigned Same School	0.0025***	0.0014*	0.0052**	0.0038**	0.0025***	0.0020**	0.0017**	0.0020*
	(0.0008)	(0.0008)	(0.0021)	(0.0019)	(0.0009)	(0.0008)	(0.0009)	(0.0011)
In Same Course	0.0163** (0.0070)	0.0162** (0.0070)	0.0179** (0.0086)	0.0178** (0.0087)	0.0116* (0.0060)	0.0099** (0.0049)	0.0069 (0.0044)	0.0110* (0.0064)
In Same School & Grade	0.0014 (0.0011)	0.0013 (0.0011)	0.0002 (0.0025)	0.0000 (0.0025)	0.0019** (0.0009)	-0.0001 (0.0013)	0.0013 (0.0012)	0.0020** (0.0009)
In Same School	0.0021** (0.0009)	0.0020** (0.0009)	0.0054** (0.0023)	0.0054** (0.0023)	0.0007 (0.0006)	0.0010 (0.0016)	-0.0000 (0.0013)	0.0006 (0.0007)
Dep. Var (mean)	0.0036	0.0036	0.0061	0.0061	0.0036	0.0036	0.0036	0.0036
Observations	124,060	124,060	42,640	42,640	124,060	124,060	124,060	124,060

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors robust to arbitrary within-CBG correlation in parentheses.

All regressions include controls for gender, race, 8th grade reading and math test scores, indicator if missing a test score, days suspended (8th grade), total days absent (8th grade), single family home indicator, indicator for year individual k turned age 5 as of 9/1, and CBG fixed effects for person j.

All models include fixed effects for each school attended (6-10th grade) by person k, except in cases of individual fixed effects (FE). Dependent Variable is an indicator for a pair ever being criminal partners. Dist. FE indicates a series of indicator variables for 200 foot intervals of pairwise distances. Same HS indicates that same school only defined based on high schools. Student FE and student by CBG FE is based on individual k.

Table 8: Interaction Effects of School Assigned on Criminal Partnerships

	(1) Any Crime Partner	(2) Number of Partner Crimes	(3) 16-18 yr old Partnership	(4) 19-21 yr old Partnership	(5) Violent Crime Partners	(6) Property Crime Partners
Assigned to Same School/Grade	0.0051*** (0.0011)	0.0107*** (0.0035)	0.0038*** (0.0009)	0.0013* (0.0007)	0.0018*** (0.0006)	0.0035*** (0.0011)
Assigned to Same School	0.0008 (0.0033)	0.0057 (0.0125)	-0.0007 (0.0020)	0.0019 (0.0021)	0.0003 (0.0012)	0.0011 (0.0031)
*Same Gender*Male	0.0053*** (0.0019)	0.0100** (0.0040)	0.0033* (0.0017)	0.0036*** (0.0010)	0.0019*** (0.0007)	0.0033** (0.0015)
Same Gender	-0.0008 (0.0014)	-0.0016 (0.0018)	-0.0007 (0.0014)	-0.0012 (0.0006)	-0.0001 (0.0005)	-0.0006 (0.0011)
Same Race	0.0239 (0.0137)	0.0839 (0.0569)	0.0199 (0.0122)	0.0064 (0.0042)	0.0044 (0.0027)	0.0189 (0.0132)
*Same Race*Black	-0.0240* (0.0140)	-0.0871 (0.0583)	-0.0199 (0.0122)	-0.0063 (0.0046)	-0.0046 (0.0030)	-0.0199 (0.0136)
*Same Race*Hispanic	-0.0043 (0.0131)	-0.0439 (0.0511)	-0.0024 (0.0138)	-0.0032 (0.0036)	0.0024 (0.0042)	-0.0034 (0.0126)
Both Suspended (8th Grade)	-0.0018 (0.0014)	-0.0006 (0.0040)	-0.0011 (0.0013)	-0.0017 (0.0010)	-0.0006 (0.0008)	-0.0002 (0.0013)
One Suspended (8th Grade)	-0.0013 (0.0015)	0.0019 (0.0041)	-0.0010 (0.0013)	-0.0015 (0.0009)	-0.0017 (0.0009)	0.0009 (0.0011)
*Both in SF Homes	0.0007 (0.0025)	-0.0058 (0.0098)	0.0017 (0.0013)	-0.0006 (0.0017)	0.0006 (0.0008)	-0.0005 (0.0024)
*One in SF Home	0.0004 (0.0020)	-0.0055 (0.0077)	0.0011 (0.0010)	0.0001 (0.0015)	0.0010 (0.0006)	-0.0005 (0.0017)
Observations	124,060	124,060	124,060	124,060	124,060	124,060

All regressions include controls for gender, race, 8th grade reading and math test scores, indicator if missing a test score, days suspended (8th grade), total days absent (8th grade), single family home indicator, indicator for year individual k turned age 5 as of 9/1, and CBG fixed effects for person j.

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors robust to arbitrary within-CBG correlation in parentheses.

Table 9: Interaction Effects of School Attended on Criminal Partnerships

	(1) Any Crime Partner	(2) Number of Partner Crimes	(3) 16-18 yr old Partnership	(4) 19-21 yr old Partnership	(5) Violent Crime Partners	(6) Property Crime Partners
In Same Course	0.0110* (0.0057)	0.0285 (0.0223)	0.0096* (0.0053)	0.0014 (0.0009)	-0.0003 (0.0008)	0.0080 (0.0053)
In Same School/Grade	0.0015 (0.0009)	0.0022 (0.0019)	0.0019** (0.0009)	-0.0002 (0.0005)	0.0012** (0.0005)	0.0003 (0.0008)
In Same School	-0.0024 (0.0031)	-0.0102 (0.0115)	-0.0037 (0.0028)	0.0019 (0.0012)	-0.0003 (0.0013)	-0.0028 (0.0029)
*Same Gender*Male	0.0030** (0.0012)	0.0052* (0.0030)	0.0020* (0.0011)	0.0018** (0.0007)	0.0002 (0.0008)	0.0023** (0.0009)
Same Gender	0.0014 (0.0008)	0.0020 (0.0014)	0.0014* (0.0008)	-0.0005* (0.0002)	0.0008 (0.0006)	0.0005 (0.0005)
*Same Race	0.0161 (0.0148)	0.0660 (0.0633)	0.0177 (0.0148)	0.0008 (0.0021)	0.0011 (0.0017)	0.0145 (0.0147)
*Same Race*Black	-0.0145 (0.0144)	-0.0624 (0.0614)	-0.0164 (0.0144)	-0.0004 (0.0024)	0.0001 (0.0017)	-0.0139 (0.0142)
*Same Race*Hispanic	-0.0091 (0.0194)	-0.0488 (0.0689)	-0.0115 (0.0195)	0.0012 (0.0030)	0.0076 (0.0078)	-0.0126 (0.0192)
*Both Suspended (8th Grade)	0.0005 (0.0019)	0.0061 (0.0061)	0.0015 (0.0018)	-0.0011 (0.0010)	0.0004 (0.0010)	0.0017 (0.0017)
*One Suspended (8th Grade)	-0.0011 (0.0019)	0.0046 (0.0072)	-0.0001 (0.0018)	-0.0014 (0.0009)	-0.0004 (0.0010)	0.0008 (0.0018)
*Both in SF Homes	-0.0006 (0.0014)	-0.0038 (0.0029)	-0.0000 (0.0010)	-0.0008 (0.0012)	-0.0010 (0.0010)	-0.0001 (0.0011)
*One in SF Home	-0.0013 (0.0014)	-0.0026 (0.0031)	-0.0003 (0.0011)	-0.0012 (0.0012)	-0.0013 (0.0012)	-0.0001 (0.0010)
Observations	124,060	124,060	124,060	124,060	124,060	124,060

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors robust to arbitrary within-CBG correlation in parentheses.

All regressions include fixed effects for individual k, CBG fixed effects for individual j.

Table 10: Cohort Size Models - Balancing Test

	(1) Same School & Age Peers (1 km)	(2) Same School & Age-Race-Male Peers (1 km)
Male	-0.0058 (0.0060)	
Hispanic	-0.0379 (0.0302)	
Black	-0.0300* (0.0168)	
Single Family Home	0.0041 (0.0784)	-0.0060 (0.0262)
Math Test Score (8th grade)	-0.0038 (0.0071)	-0.0004 (0.0044)
Read Test Score (8th grade)	0.0091 (0.0076)	0.0062* (0.0035)
Total Days Suspended from School (8th grade)	0.0002 (0.0009)	0.0004 (0.0006)
Total Days Absent (8th grade)	-0.0000 (0.0004)	-0.0000 (0.0002)
Observations	34,960	34,960
F-Stat (p-value)	0.30	0.31
R ²	0.92	0.97

* p < 0.1, ** p < 0.05, *** p < 0.01. The dependent variable in column one indicates the number of same age peers (0s) that live within 1 km and are assigned to the same middle or high school. Column two restricts the definition of peers in column one to only include those individuals that are male and same race also. The sample used for determining the number of peers is based on all students attending CMS at school age 14 at any time from 2003-2009.

All regressions include controls for gender, race, 8th grade reading and math test scores, indicator if missing a test score, days suspended (8th grade), total days absent (8th grade), single family home indicator, and the number of same age peers within 1 km in column 1 and the number of same age-race-male peers within 1 km in column 2. Column one includes Census Block Group 2000 (CBG) by age fixed effects. Column 2 includes Census Block Group 2000 (CBG) by age, gender and race fixed effects. Standard errors robust to arbitrary correlation within CBG.

Table 11: Cohort Size Model Results

	(1) Ever Arrested (16-21)	(2) Ever Arrested Violent (16-21)	(3) Ever Arrested Property (16-21)	(4) Any Crime Partners	(5) Violent Crime Partners	(6) Property Crime Partners
Same School & Age Peers within 1 km (0s)	0.0007 (0.0036)	0.0013 (0.0016)	0.0018 (0.0025)	0.0012 (0.0010)	0.0009 (0.0007)	-0.0005 (0.0009)
Same Age Peers within 1 km (0s)	-0.0010 (0.0038)	-0.0003 (0.0018)	-0.0016 (0.0027)	-0.0005 (0.0010)	-0.0005 (0.0007)	0.0006 (0.0009)
Same School & Age-Race-Male Peers within 1 km (0s)	0.0204** (0.0099)	0.0088** (0.0040)	0.0102* (0.0057)	0.0064* (0.0034)	0.0024 (0.0024)	0.0013 (0.0030)
Same Age-Race-Male Peers within 1 km (0s)	-0.0131 (0.0112)	-0.0040 (0.0054)	-0.0036 (0.0064)	-0.0008 (0.0035)	0.0000 (0.0020)	0.0014 (0.0035)
Dep. Var (mean)	0.1678	0.0326	0.0713	0.0103	0.0029	0.0057
Observations	34,960	34,960	34,960	34,960	34,960	34,960

* p < 0.1, ** p < 0.05, *** p < 0.01. The top panel of results is based on defining an individual's number of peers (0s) as those students that are the same age and live within 1 km. The bottom panel of results restricts this definition of peers (0s) to those individuals that are male and same race. The sample used for determining the number of peers is based on all students attending CMS at school age 14 at any time from 2003-2009. Each pair of coefficients (same neighborhood (≤ 1 km) and same neighborhood & school) are for a separate regression based on the dependent variable given in column headings.

All regressions include controls for gender, race, 8th grade reading and math test scores, indicator if missing a test score, days suspended (8th grade), total days absent (8th grade), single family home indicator.

The top panel includes Census Block Group 2000 (CBG) by age fixed effects. The bottom panel includes Census Block Group 2000 (CBG) by age, gender and race fixed effects. Standard errors robust to arbitrary correlation within CBG.

Ever Arrested Property (16-21) indicates that an individual was arrested for auto theft, burglary, fraud/forgery or larceny between ages 16-21. Ever Arrested Violent (16-21) indicates that an individual was arrested for aggravated/sexual/simple assault, rape or robbery between ages 16-21. Partner dependent variables indicate that an individual was arrested for a crime for which another person was also arrested.

Table 12: Balancing Test - 2001 Address

	(1) Assigned Same School	(2) Assigned Same School & Grade
Male	-0.006 (0.010)	-0.000 (0.014)
Hispanic	-0.001 (0.026)	0.005 (0.048)
Black	0.007 (0.015)	0.016 (0.029)
Single Family Home	0.001 (0.007)	0.007 (0.015)
Math Test Score (8th grade)	0.003 (0.005)	0.001 (0.009)
Read Test Score (8th grade)	0.005 (0.004)	0.014* (0.008)
Total Days Suspended from School (8th grade)	-0.000 (0.000)	-0.000 (0.001)
Total Days Absent (8th grade)	-0.000 (0.000)	-0.000 (0.000)
Observations	93,685	29,267
F-Stat (p-value)	0.87	0.60

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors robust to arbitrary within-CBG correlation in parentheses.

All regressions include controls for gender, race, 8th grade reading and math test scores, indicator if missing a test score, days suspended (8th grade), total days absent (8th grade), single family home indicator, indicator for year individual k turned age 5 as of 9/1, and CBG fixed effects for person j .

The sample included in this table represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 1 km of each other based on 2001-2002 school address and live at least 130 feet apart (minimum distance between two students assigned to different schools) and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

We define assigned to the same school as two individuals being assigned to the same middle or high school based on 2003 school attendance boundaries. Same grade is based on starting kindergarten at age 5 and normal grade progression. Column 2 excludes same school, different grade pairs. F-statistics reports p-value that all reported covariates are jointly equal to zero.

Table 13: Other Models - 2001 Address

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Main	Dist. FE	1/2 km	Dist. FE 1/2 km	Same HS only	Student FE	Student FE <i>Same HS only</i>	Student by CBG FE
Assigned Same School & Grade	0.0018** (0.0007)	0.0018** (0.0007)	0.0012 (0.0014)	0.0011 (0.0014)	0.0017** (0.0007)	0.0013** (0.0005)	0.0012** (0.0005)	0.0012** (0.0006)
Assigned Same School	0.0003 (0.0010)	-0.0004 (0.0010)	0.0026 (0.0016)	0.0022 (0.0017)	0.0005 (0.0008)	0.0009 (0.0007)	0.0009 (0.0005)	0.0010 (0.0009)
In Same Course	0.0056** (0.0021)	0.0055** (0.0021)	0.0042 (0.0045)	0.0041 (0.0045)	0.0049*** (0.0014)	0.0031* (0.0018)	0.0026* (0.0013)	0.0026 (0.0017)
In Same School & Grade	0.0011 (0.0011)	0.0010 (0.0011)	-0.0027 (0.0026)	-0.0028 (0.0027)	-0.0014 (0.0020)	0.0015* (0.0009)	0.0006 (0.0018)	0.0015* (0.0009)
In Same School	0.0022** (0.0008)	0.0021** (0.0008)	0.0047** (0.0019)	0.0047** (0.0019)	0.0031** (0.0012)	0.0014*** (0.0005)	0.0017 (0.0012)	0.0015** (0.0006)
Dep. Var (mean)	0.0022	0.0022	0.0032	0.0032	0.0022	0.0022	0.0022	0.0022
Observations	93,685	93,685	34,400	34,400	93,685	93,685	93,685	93,685

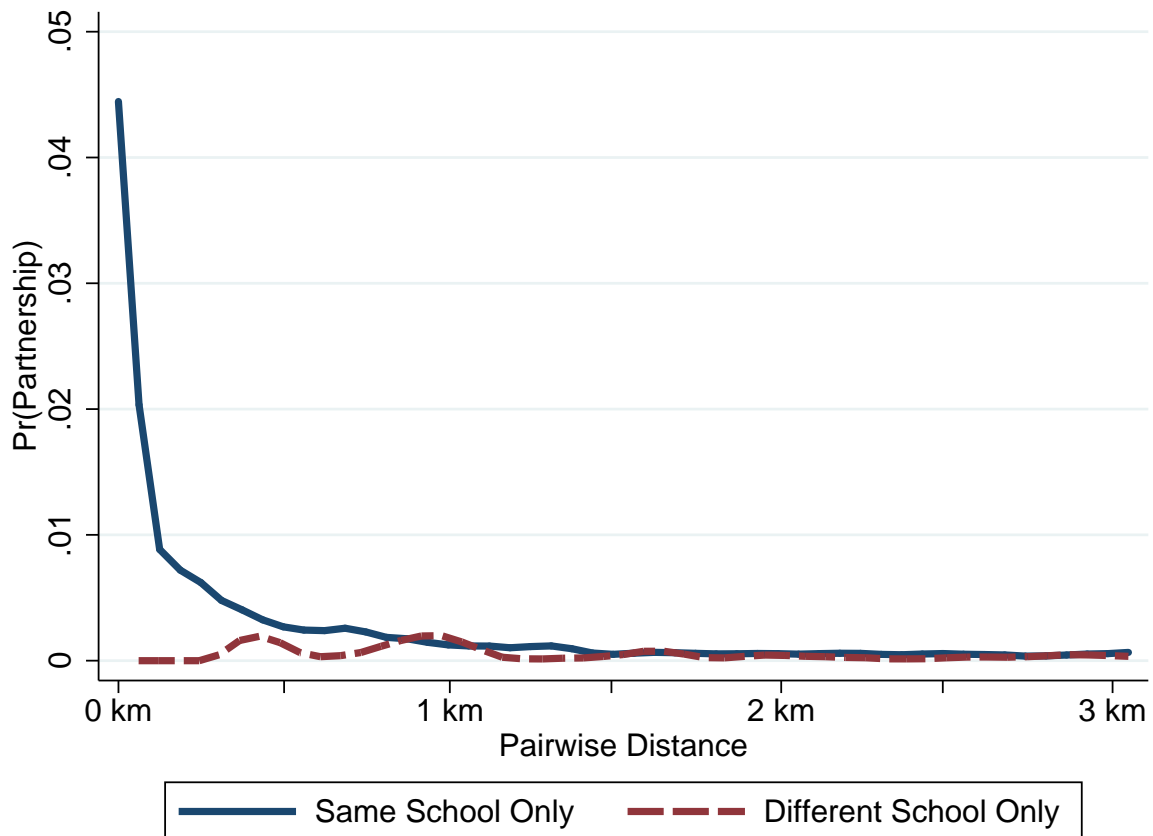
* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors robust to arbitrary within-CBG correlation in parentheses.

The sample included in this table represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 1 km of each other based on 2001-2002 school address and live at least 130 feet apart (minimum distance between two students assigned to different schools) and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

All regressions include controls for gender, race, 8th grade reading and math test scores, indicator if missing a test score, days suspended (8th grade), total days absent (8th grade), single family home indicator, indicator for year individual k turned age 5 as of 9/1, and CBG fixed effects for person j.

All models include fixed effects for each school attended (6-10th grade) by person k, except in cases of individual fixed effects. Dependent Variable is an indicator for a pair ever being criminal partners. Dist. FE indicates a series of indicator variables for 200 foot intervals of pairwise distances. Same HS indicates that same school only defined based on high schools. Student FE is based on individual k.

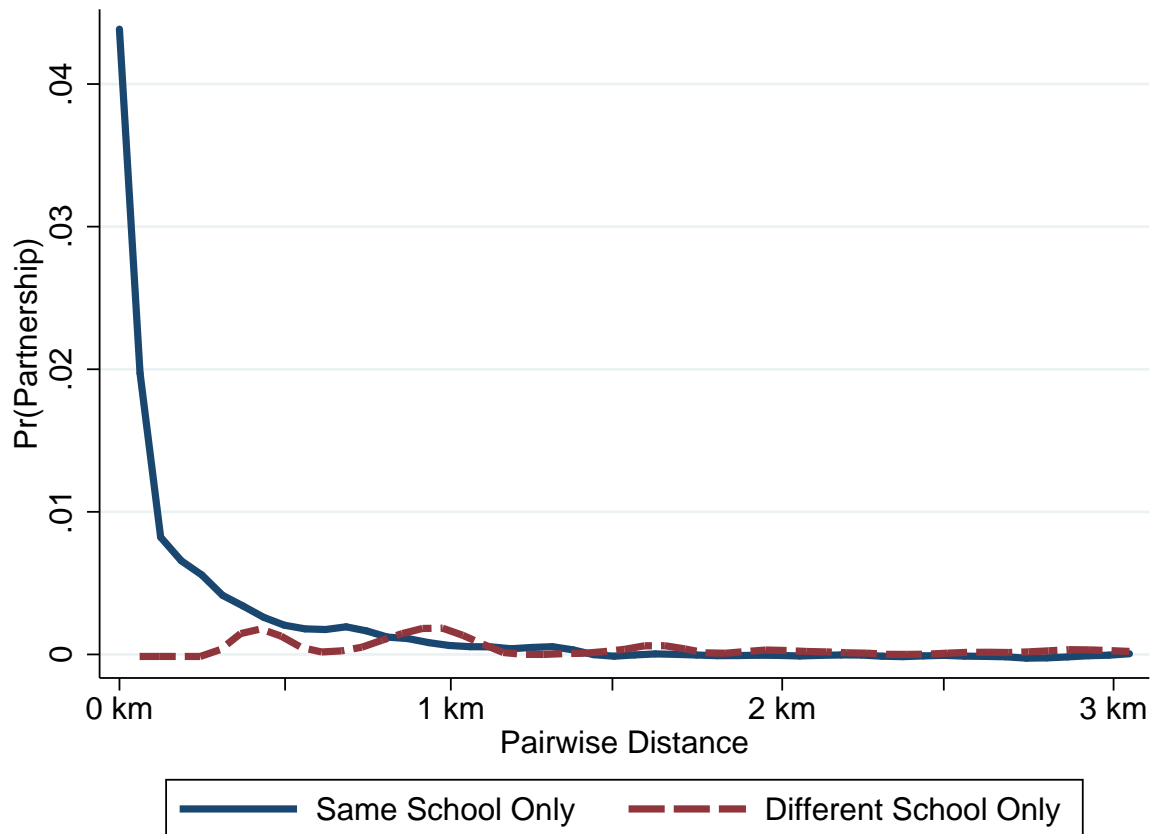
Figure 1: Unconditional Probabilities of Partnership (Same vs. Different Schools)



The sample included in this figure represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 3 km of each other based on school age 14 address and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

This figure provides the unconditional probability of same school and different school residuals by distance b/t partners in a pair.

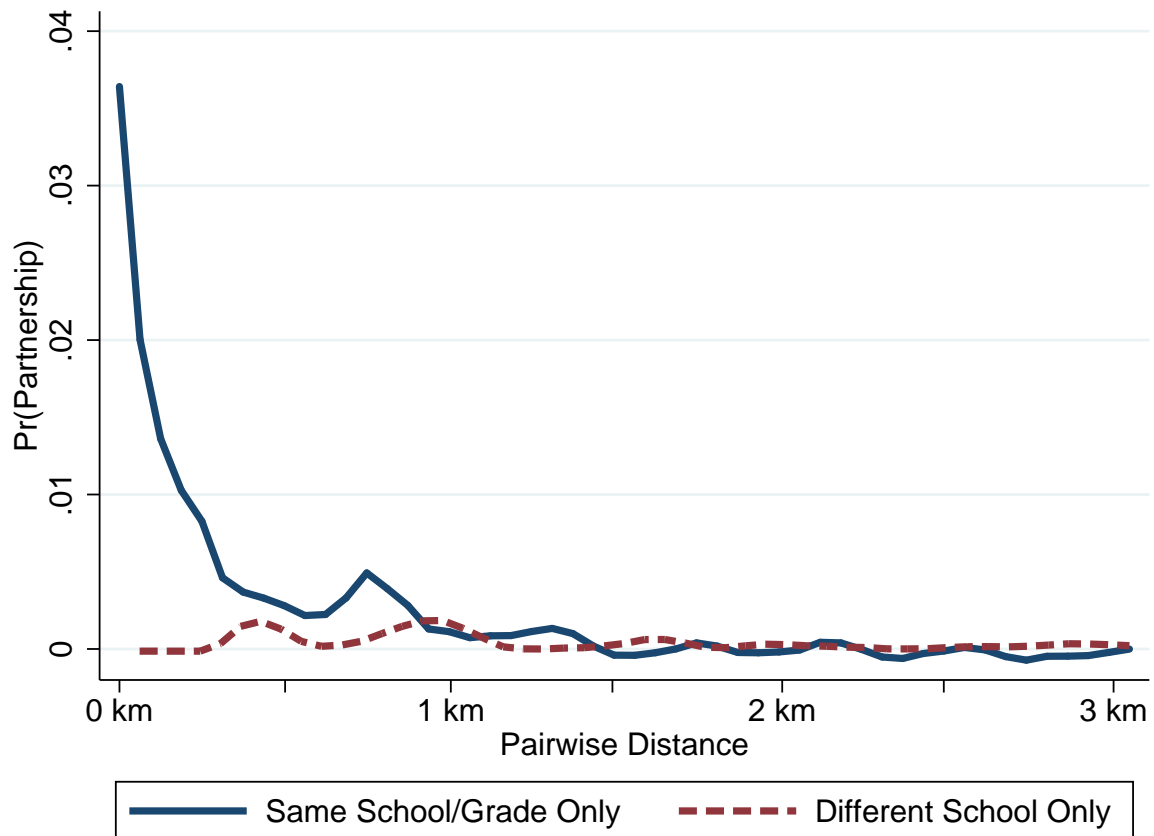
Figure 2: Conditional Probabilities of Partnership (Same vs. Different Schools)



The sample included in this figure represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 3 km of each other based on school age 14 address and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

This figure provides the distribution of same school and different school residuals by distance b/t partners in a pair. Residuals calculated using a first stage regression which controls for individual attributes of person j (gender, race, test scores, absences, suspensions), school year born fixed effects for k , and CBG fixed effects for j .

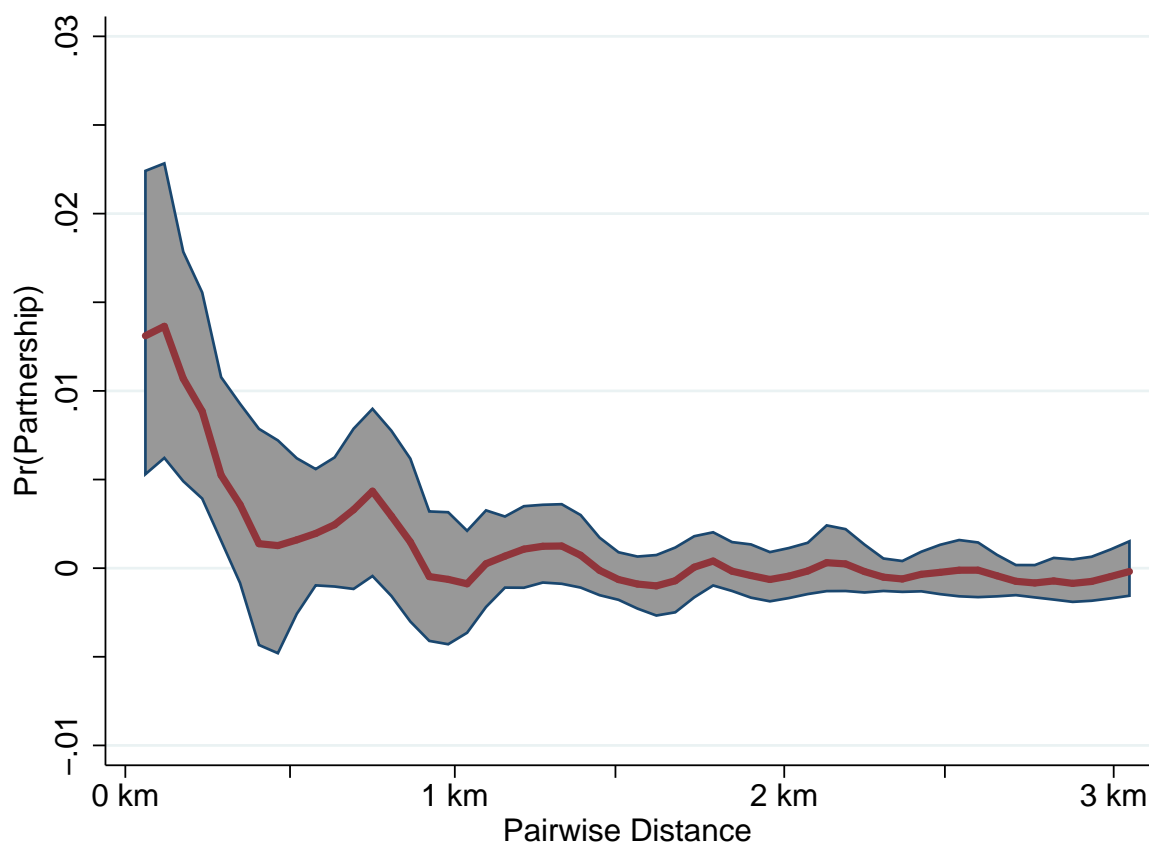
Figure 3: Conditional Probabilities of Partnership (Same School/Grade vs. Different Schools)



The sample included in this figure represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 3 km of each other based on school age 14 address and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

This figure provides the distribution of same school and grade, and different school residuals by distance b/t partners in a pair. Residuals calculated using a first stage regression which controls for individual attributes of person k (gender, race, test scores, absences, suspensions), school year born fixed effects for k, and CBG fixed effects for j.

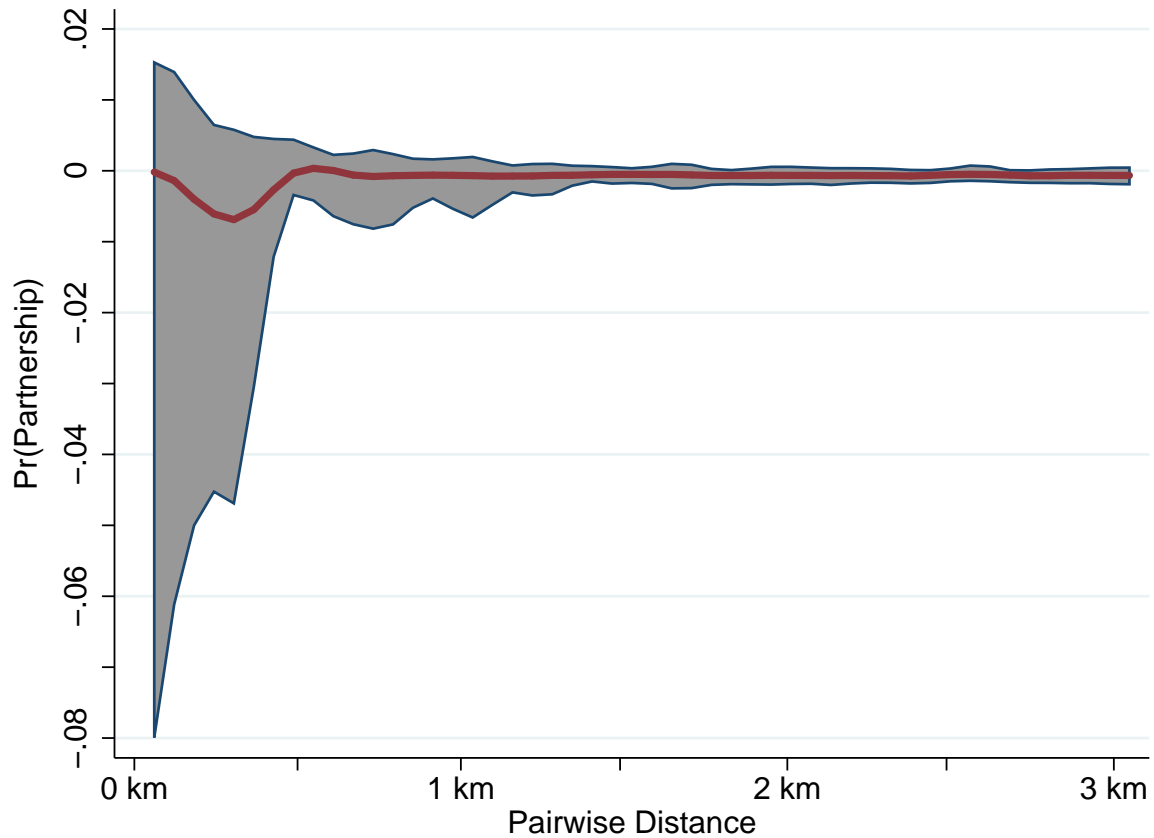
Figure 4: Difference in Conditional Probabilities of Partnership



The sample included in this figure represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 3 km of each other based on school age 14 address and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

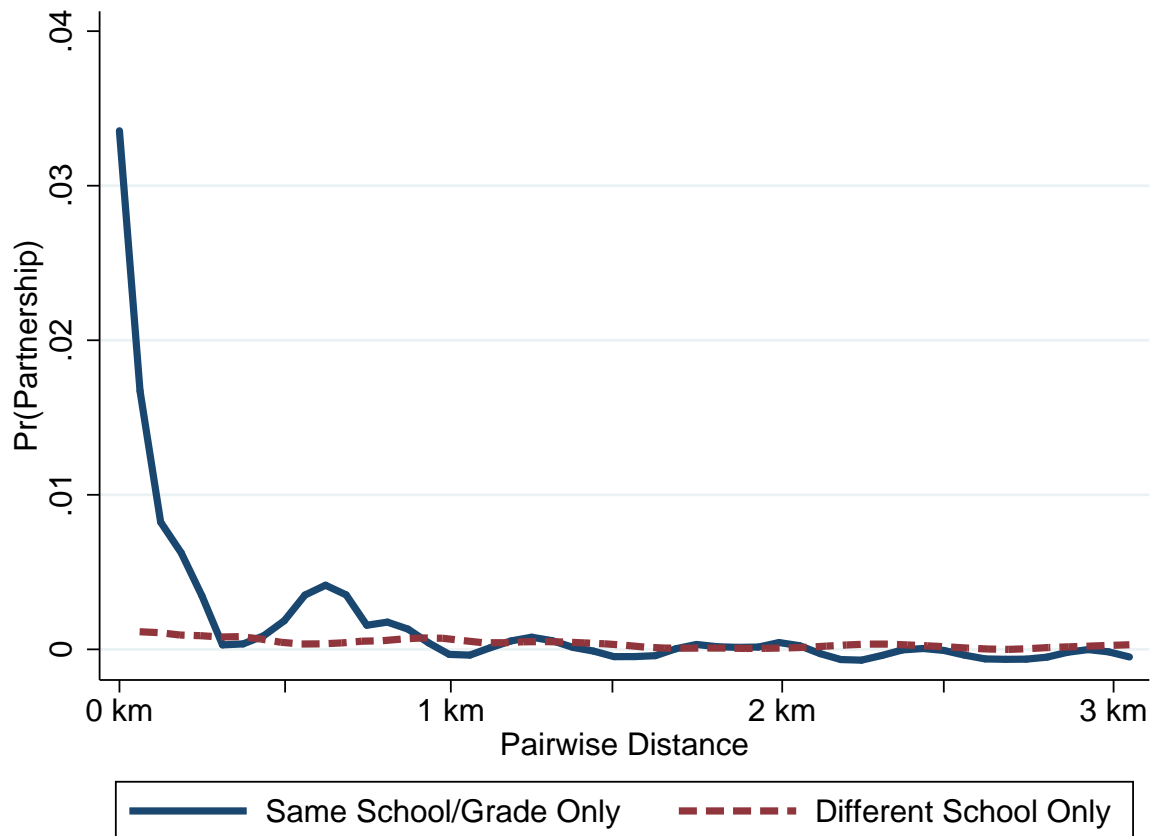
This figure provides the difference in conditional probability (residuals) of partnership between same school and grade and different school pairs. 95% confidence intervals given by shaded area and were generated by resampling data using 500 bootstraps. Kernel-weighted local polynomial smoothing implemented in order to generate a continuous distribution of probabilities and to account for any variation in the distance between individuals which is computed based on distances between the centroid of each parcel and thus influenced by the configuration of parcels which may differ from location of individuals on a give parcel.

Figure 5: Falsification Test



Falsification Test based on randomly shifting school attendance boundaries in all directions by between 1 and 2km. Students are then reassigned as same/different schools based on the random boundary shift. With the new school assignments, we calculate the distribution of same school and different school residuals by distance b/t partners in a pair. The solid line indicates the mean results and shaded areas indicates the range of results (5-95%) based on 500 replications.

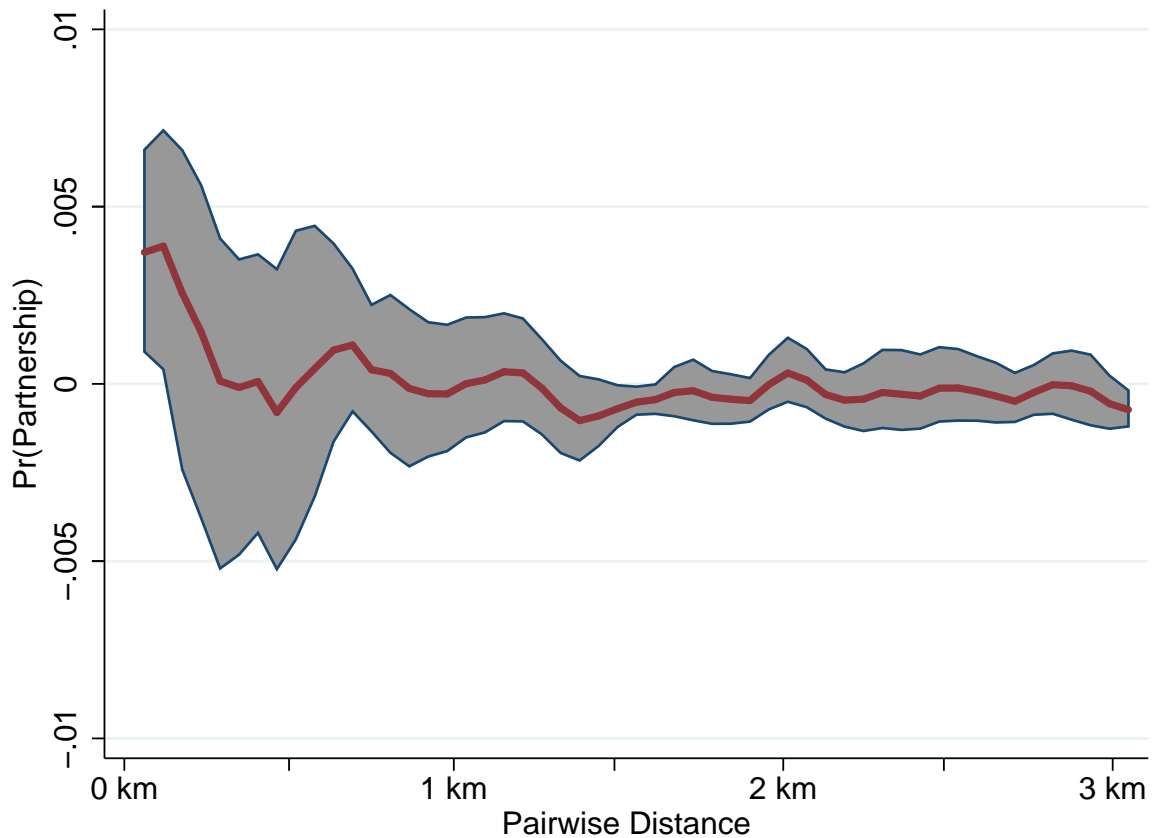
Figure 6: Conditional Probabilities of Partnership - 2001 Address



The sample included in this figure represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 3 km of each other based on 2001-2002 school address and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

This figure provides the distribution of same school and grade, and different school residuals by distance b/t partners in a pair. Residuals calculated using a first stage regression which controls for individual attributes of person k (gender, race, test scores, absences, suspensions), school year born fixed effects for k, and CBG fixed effects for j.

Figure 7: Difference in Conditional Probabilities of Partnership - 2001 Address



The sample included in this figure represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 3 km of each other based on 2001-2002 school address and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

This figure provides the difference in conditional probability (residuals) of partnership between same school and grade and different school pairs. 95% confidence intervals given by shaded area and were generated by resampling data using 500 bootstraps. Kernel-weighted local polynomial smoothing implemented in order to generate a continuous distribution of probabilities and to account for any variation in the distance between individuals which is computed based on distances between the centroid of each parcel and thus influenced by the configuration of parcels which may differ from location of individuals on a given parcel.

A. Appendix

Table A.1: Impact of School Assignment on Partnerships by Types of Crime

	(1) Assault Crime Partner	(2) Burglary Crime Partner	(3) Drug Crime Partnership	(4) Robbery Crime Partnership	(5) Theft Crime Partnership	(6) Other Crime Partnership
<u>Pairs \leq 1 km</u>						
Assigned Same School & Grade	0.0014** (0.0006)	0.0019** (0.0008)	0.0002 (0.0003)	0.0001 (0.0003)	0.0008 (0.0007)	0.0003 (0.0003)
Assigned Same School	0.0003 (0.0003)	0.0009* (0.0005)	0.0002 (0.0001)	0.0003* (0.0001)	0.0007 (0.0005)	0.0001 (0.0002)
Dep. Var (mean)	0.0005	0.0012	0.0006	0.0004	0.0010	0.0003
Observations	124,060	124,060	124,060	124,060	124,060	124,060
<u>Pairs \leq 1/2 km</u>						
Assigned Same School & Grade	0.0023* (0.0012)	0.0039*** (0.0014)	-0.0001 (0.0004)	-0.0003 (0.0004)	0.0003 (0.0015)	0.0006 (0.0006)
Assigned Same School	0.0009 (0.0006)	0.0019*** (0.0007)	0.0002 (0.0002)	0.0000 (0.0007)	0.0020 (0.0017)	0.0001 (0.0002)
Dep. Var (mean)	0.0009	0.0024	0.0007	0.0007	0.0019	0.0003
Observations	42,648	42,648	42,648	42,648	42,648	42,648
<u>Pairs \leq 2 km</u>						
Assigned Same School & Grade	0.0005** (0.0002)	0.0010*** (0.0003)	0.0002 (0.0001)	0.0000 (0.0001)	0.0003 (0.0003)	0.0001 (0.0001)
Assigned Same School	0.0001 (0.0001)	0.0003* (0.0001)	0.0001** (0.0001)	0.0002*** (0.0001)	0.0002** (0.0001)	0.0001 (0.0001)
Dep. Var (mean)	0.0003	0.0005	0.0003	0.0002	0.0004	0.0002
Observations	397,792	397,792	397,792	397,792	397,792	397,792

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors robust to arbitrary within-CBG correlation in parentheses.

All regressions include controls for gender, race, 8th grade reading and math test scores, indicator if missing a test score, days suspended (8th grade), total days absent (8th grade), single family home indicator, indicator for year individual k turned age 5 as of 9/1, and CBG fixed effects for person j.

The sample included in this table represents all unique pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within a given distance (given by table subheadings) of each other based on school age 14 address and live at least 130 feet apart (minimum distance between two students assigned to different schools) and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

Dependent Variable is an indicator based on column heading.

Table A.2: Impact of School Attended on Partnerships by Types of Crime

	(1) Assault Crime Partner	(2) Burglary Crime Partner	(3) Drug Crime Partnership	(4) Robbery Crime Partnership	(5) Theft Crime Partnership	(6) Other Crime Partnership
Pairs ≤ 1 km						
In Same Course	0.000 (0.001)	0.003 (0.002)	0.002** (0.001)	0.000 (0.000)	0.006 (0.005)	-0.000 (0.001)
In Same School & Same Grade	0.001** (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001 (0.001)	0.001* (0.000)
In Same School	0.000 (0.000)	0.001 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000* (0.000)
Dep. Var (mean)	0.0005	0.0013	0.0005	0.0003	0.0010	0.0003
Observations	124,060	124,060	124,060	124,060	124,060	124,060

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors robust to arbitrary within-CBG correlation in parentheses.

The sample included in this table represents all pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart), live within 1 km of each other based on school age 14 address and live at least 130 feet apart (minimum distance between two students assigned to different schools) and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

All regressions include fixed effects for individual k, CBG fixed effects for individual j. Dependent Variable is an indicator based on column heading. We define attended the same school as two individuals matriculating for at least one year at the same middle or high school. Same grade is based on a pair of students being assigned to the same grade. Same course indicates if two individuals took at least two courses together in grades 6-10.

Table A.3: Cohort Size Models - Balancing Test (CBG neighborhood)

	(1) Same School & Age Peers (1 km)	(2) Same School & Age-Race-Male Peers (1 km)
Male	-0.0059 (0.0072)	
Hispanic	-0.0197 (0.0512)	
Black	0.0292 (0.0244)	
Single Family Home	-0.0146 (0.0850)	-0.0042 (0.0218)
Math Test Score (8th grade)	0.0135 (0.0094)	0.0055 (0.0050)
Read Test Score (8th grade)	-0.0009 (0.0065)	0.0008 (0.0040)
Total Days Suspended from School (8th grade)	0.0011 (0.0007)	0.0005 (0.0006)
Total Days Absent (8th grade)	0.0001 (0.0004)	0.0002 (0.0002)
Observations	34,961	34,961
F-Stat (p-value)	0.60	0.59
R ²	0.97	0.98

* p < 0.1, ** p < 0.05, *** p < 0.01. The dependent variable in column one indicates the number of same age peers (0s) that live in the same CBG and are assigned to the same middle or high school. Column two restricts the definition of peers in column one to only include those individuals that are the same gender and race also. The sample used for determining the number of peers is based on all students attending CMS at school age 14 at any time from 2003-2009.

All regressions include controls for gender, race, 8th grade reading and math test scores, indicator if missing a test score, days suspended (8th grade), total days absent (8th grade), single family home indicator. Column one includes Census Block Group 2000 (CBG) by age fixed effects. Column 2 includes Census Block Group 2000 (CBG) by age, gender and race fixed effects. Standard errors robust to arbitrary correlation within CBG.

Table A.4: Cohort Size Model Results (CBG neighborhood)

	(1) Ever Arrested (16-21)	(2) Ever Arrested Violent (16-21)	(3) Ever Arrested Property (16-21)	(4) Any Crime Partners	(5) Violent Crime Partners	(6) Property Crime Partners
Same School & Age Peers within 1 km (0s)	0.0021 (0.0021)	0.0003 (0.0011)	0.0018 (0.0012)	0.0013*** (0.0005)	0.0004* (0.0003)	0.0007 (0.0006)
Same School & Age-Race-Male Peers within 1 km (0s)	0.0121 (0.0086)	0.0053 (0.0037)	0.0052 (0.0051)	0.0035*** (0.0013)	0.0014 (0.0010)	0.0013 (0.0018)
Dep. Var (mean)	0.1678	0.0326	0.0713	0.0103	0.0029	0.0057
Observations	34,961	34,961	34,961	34,961	34,961	34,961

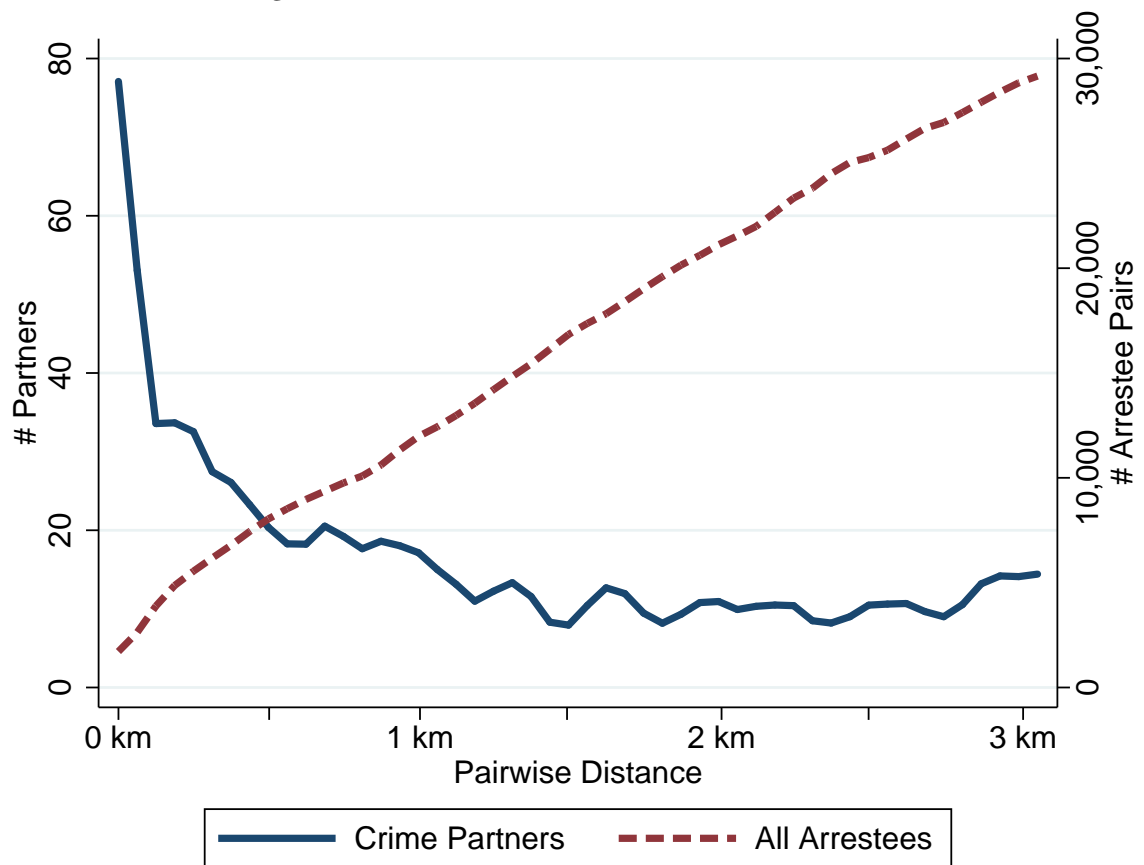
* p < 0.1, ** p < 0.05, *** p < 0.01. The top panel of results is based on defining an individual's number of peers (0s) as those students that are the same age and live in the same CBG. The bottom panel of results restricts this definition of peers (0s) to those individuals of the same gender and race. The sample used for determining the number of peers is based on all students attending CMS at school age 14 at any time from 2003-2009. Each pair of coefficients (same CBG and same CBG & school) are for a separate regression based on the dependent variable given in column headings.

All regressions include controls for gender, race, 8th grade reading and math test scores, indicator if missing a test score, days suspended (8th grade), total days absent (8th grade), single family home indicator.

The top panel includes Census Block Group 2000 (CBG) by age fixed effects. The bottom panel includes Census Block Group 2000 (CBG) by age, gender and race fixed effects. Standard errors robust to arbitrary correlation within CBG.

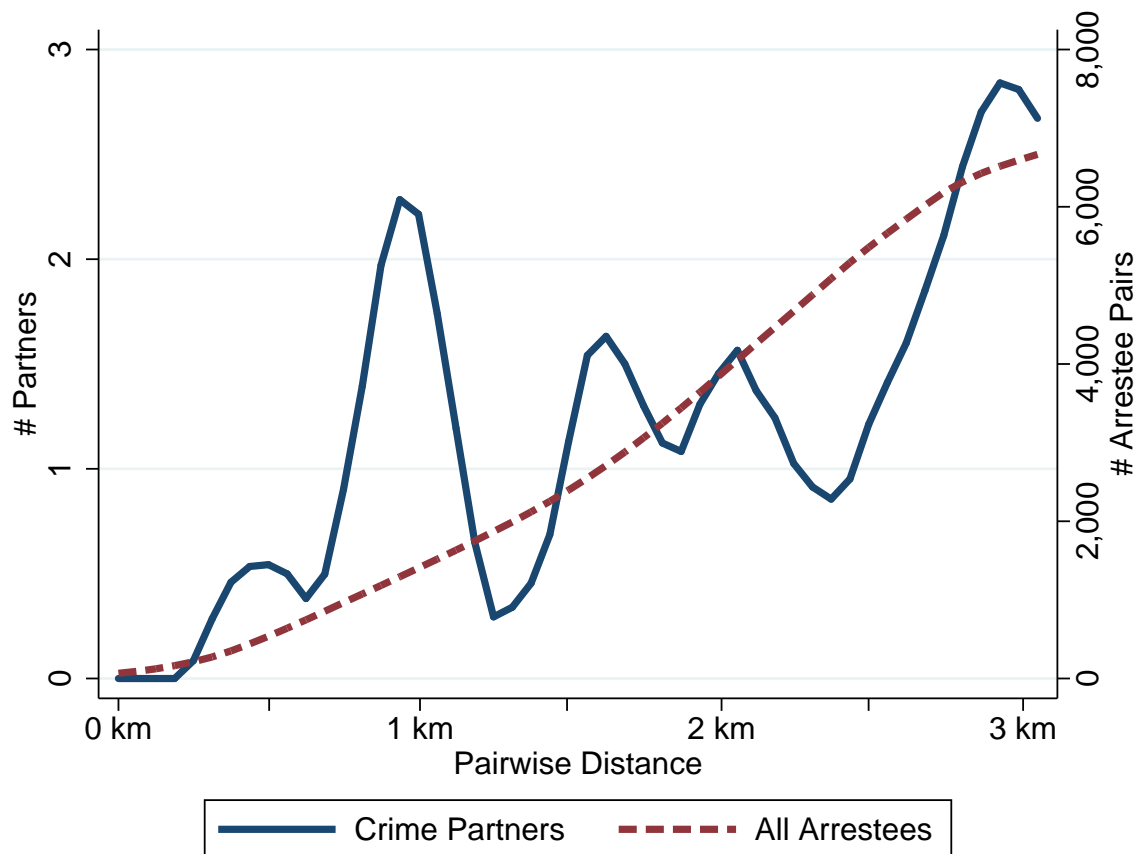
Ever Arrested Property (16-21) indicates that an individual was arrested for auto theft, burglary, fraud/forgery or larceny between ages 16-21. Ever Arrested Violent (16-21) indicates that an individual was arrested for aggravated/sexual/simple assault, rape or robbery between ages 16-21. Partner dependent variables indicate that an individual was arrested for a crime for which another person was also arrested.

Figure A.1: Distribution of Pairwise Distances - All



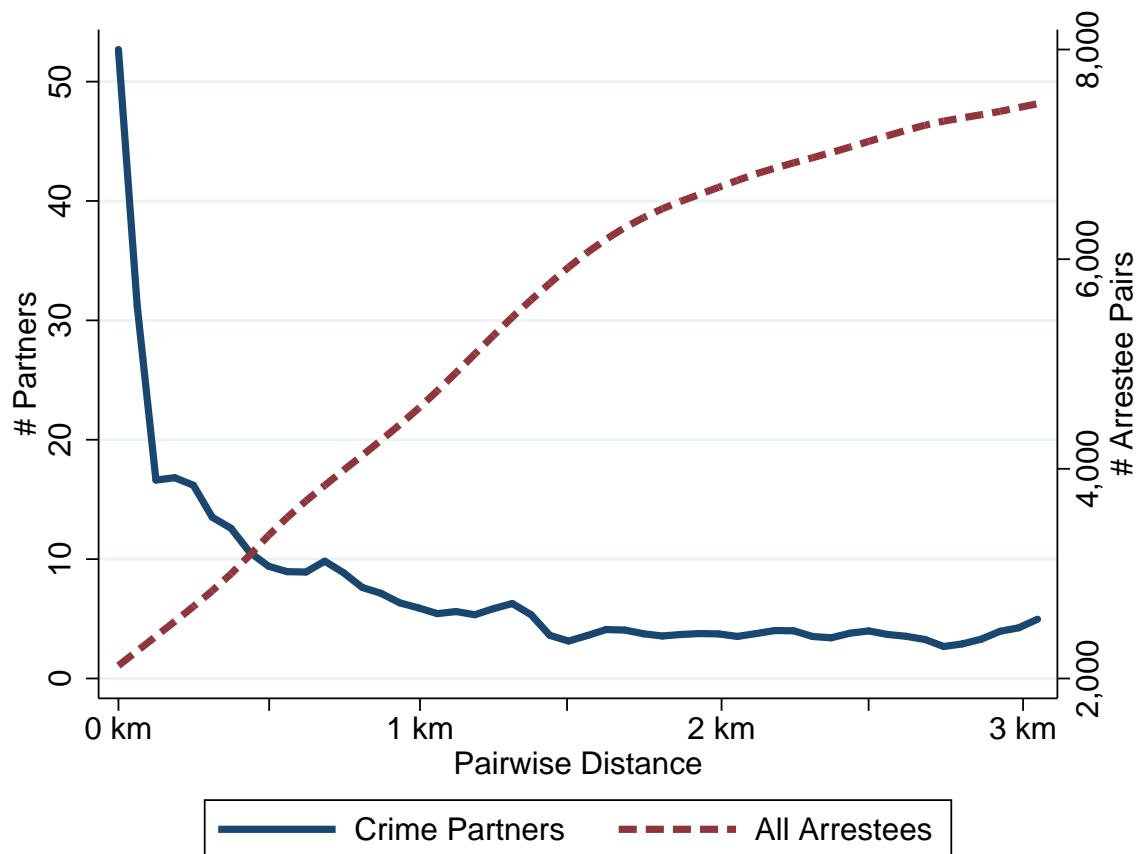
The sample included in this figure represents all unique pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart) based on age 14 address and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

Figure A.2: Distribution of Pairwise Distances - Different School Only



The sample included in this figure represents all unique pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart) based on age 14 school address, assigned to different schools and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.

Figure A.3: Distribution of Pairwise Distances - Same School Only



The sample included in this figure represents all unique pairs of individuals arrested between age 16-21 who are three years or less apart in age (less than 5% of criminal partners are more than 3 year apart) based on age 14 school address, assigned to the same schools and individual j resides in a CBG bisected by a new 2002 middle or high school attendance zone boundary.